ABSTRACT OF THE DISCLOSURE

DYNAMIC ONLINE MULTI-PARAMETER OPTIMIZATION SYSTEM AND METHOD FOR AUTONOMIC COMPUTING SYSTEMS

An improved method and system for performing dynamic online multi-parameter optimization for autonomic computing systems are provided. With the method and system of the present invention, a simplex, i.e. a set of points in the parameter space that has been directly sampled, is maintained. The system's performance with regard to a particular utility value is measured for the particular setting of configuration parameters associated with each point in the simplex. A new sample point is determined using the geometric transformations of the simplex. The method and system provide mechanisms for limiting the size of the simplex that is generated through these geometric transformations so that the present invention may be implemented in noisy environments in which the same configuration settings may lead to different results with regard to the utility value. In addition, mechanisms are provided for resampling a current best point in the simplex to determine if the environment has changed. If a sufficiently different utility value is obtained from a previously sampled utility value for the point in the simplex, then rather than contracting, the simplex is expanded. If the difference between utility values is not sufficient enough, then contraction of the simplex is performed. In addition, in order to allow for both real and integer valued parameters in the simplex, a mechanism is provided by which invalid valued parameters that are generated by geometric transformations being performed on the simplex are mapped to a nearest valid value. Similarly, parameter values that violate constraints are mapped to values that satisfy constraints taking care that the dimensionality of the simplex is not reduced.